

## PATENT

REMARKS

The Examiner is thanked for the careful examination of the application.

The Examiner has rejected all of the pending claims under 35 U.S.C. § 103 based upon the Wahbe and Honcik references, or in combination with the Applicant's admitted prior art.

The Applicant respectfully suggests that all of the claims, as amended, are patentable in view of the cited references. Furthermore, the Applicant believes that the Wahbe and Honcik references fail to establish a *prima facie* case of obviousness with respect to the claims, as amended.

When examining a claim for obviousness, each and every limitation of the claims must be fully considered. To fail to fully consider a single claim limitation is a failure to consider the claim as a whole, as is required by §103.

Claim 1 includes limitations to a first native **processor** instruction set. It further includes limitations to a first virtual machine instruction set which includes said first set of native **processor** instructions.

The Wahbe reference teaches a mechanism for protecting the system against malicious application software. His focus is on restricting the software to a generic memory protection model that sandboxes the memory space of the software. In other words, Wahbe assumes that the microprocessor works properly and the application software is the potential source for errors.

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The present invention teaches protecting the software from a "malicious" system (processor). i.e. We assume that the application software, especially the FAA certified software, is extremely reliable and is not the source of errors. Instead, we assume, correctly, that the general purpose microprocessor has latent defects which need to be addressed. Our focus is on restricting the virtual machine to a ***restricted subset of the underlying processor***, thus sandboxing the functionality of the VM implementation.

Wahbe's virtual machine does not purport to protect against faults in the generic processor; his purpose is to protect against faults in the user software. Wahbe speaks of instructions that are likely to result in defects when executed. However, as the Examiner points out (paragraph 1, Page 3 of the office action), Wahbe is referring to instructions in the virtual machine instruction set. When we discuss instructions likely to expose defects, we are referring to instructions in the native processor instruction set of the underlying processor.

Additionally, Wahbe suggests abstracting away from the underlying hardware (p2, 20-25). We teach a strict analysis of the features of the underlying hardware employed by the VM.

When you appreciate the quantity and character of the differences between Wahbe and the present invention, it becomes clear that there are no teachings, nor any suggestions, that Wahbe somehow be modified or changed to apply to differences in the native processor instruction set. When there are not even any suggestions in the cited references to modify or change the cited references to arrive at the claimed

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combination, it becomes clear that the references fail to establish a *prima facie* case of obviousness.

With respect to claim 11, the Wahbe reference fails to teach simultaneously executing an application software "without performing checks on errors caused by said first application and without distinguishing between safe and unsafe instructions for an instruction set of said first virtual machine."

With respect to claim 19, the cited references fail to establish a *prima facie* case of obviousness with respect to the claimed method. There is no teaching in the cited references that one would even think of "*refraining from distinguishing between safe and unsafe instructions of said first virtual machine; and refraining from distinguishing between safe and unsafe instructions of said second virtual machine;*".

Additionally, there is no teaching in Wahbe of running any type of application software "without performing checks for potential errors in said avionics application;".

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These new claim limitations clearly distinguish the Wahbe reference. The Applicant believes that the application and claims, as amended, are in condition for allowance, and early notification of the same would be much appreciated.

Respectfully submitted,

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